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**FEE HUNTING ON MIXED PUBLIC AND PRIVATE LAND:
AN ECONOMIC REVIEW AND ASSESSMENT**

By

**E. Bruce Godfrey
Darwin B. Nielsen**

FEE HUNTING ON MIXED PUBLIC AND PRIVATE LAND: AN ECONOMIC REVIEW AND ASSESSMENT

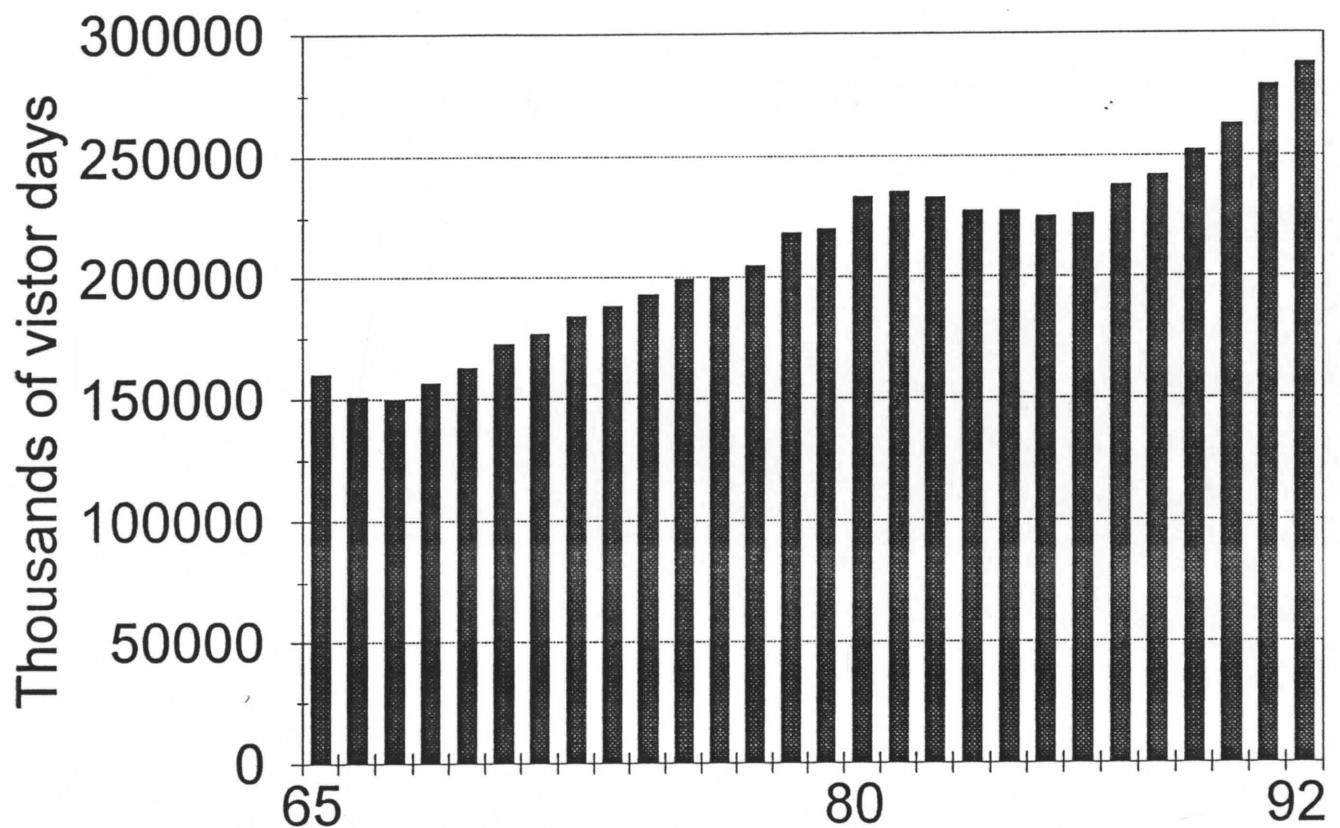
E. Bruce Godfrey
and
Darwin B. Nielsen¹

The use of lands for various recreational activities has increased dramatically since World War II. Some of this increase is shown for lands administered by the Forest Service and Bureau of Land Management (BLM) in Figures 1 and 2. The increased use of federally administered lands for recreation is of concern to public land administrators as well as owners of private land in the western U.S. Private landowners have wondered how they might capture some of the financial rewards from recreation related activities. For example, a number of individuals and organizations have suggested that farmers and ranchers in the western United States could profit by offering hunting opportunities on privately owned lands.² This alternative is not without precedence. Others (Cohen; Steinbach et al.) have shown that hunting is a profitable enterprise for ranchers located in private land states such as Texas. It is also projected that fee hunting will increase in the future (Flather and Hoekstra). However, this alternative may not be as feasible in areas where a large portion of the land is managed by some agency of federal or state government as it is in states where lands are primarily privately owned..

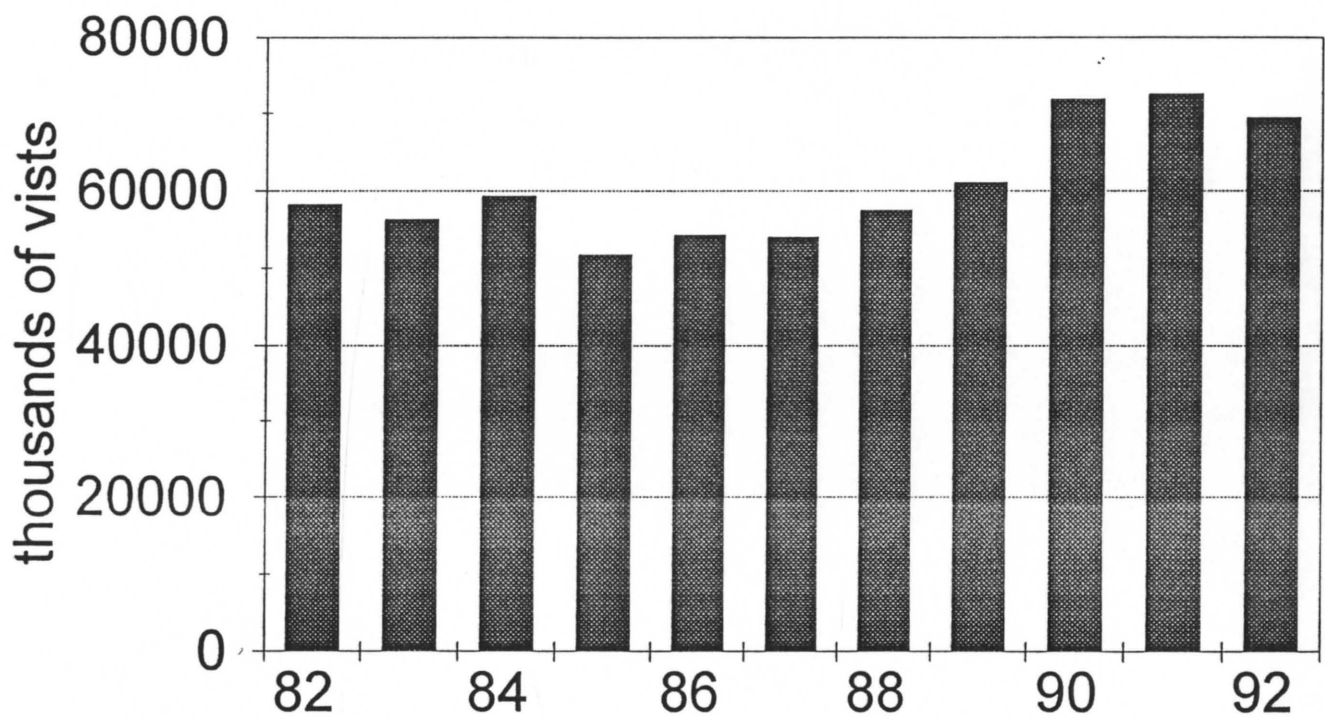
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²In this paper fee hunting is defined to be those cases when private landowners sell the opportunity to hunt on private lands. This includes a number of alternative methods that may be used to sell access and/or services. Little research has been conducted on this topic in most "public" land states. As a result, much of what is contained herein may be viewed as testable hypotheses that may be modified when/if additional research is conducted concerning fee hunting in the western United States.

**Figure 1. Recreational use of
Forest Service lands, 1965-92.**



**Figure 2. Recreational use of
BLM lands, 1982-92.**



Source: Public land Statistics

Impediments to Fee Hunting In Public Land States

While fee hunting does exist in some areas of states having large acreages of public lands, the distribution of these opportunities is not evenly distributed. For example, Jordon and Workman found that fee hunting for deer and elk in Utah existed in nearly every county in the state. However, more than 70% of the fee hunting lands were in five northern counties where a relatively small portion of the land is publically owned. These differences suggest that there are factors that both impede and encourage the establishment of fee hunting areas.

"Free" use of Public Lands

One of the strongest impediments to fee hunting on private lands stems from the fact that hunting on publicly owned lands can occur at low or zero cost (Langner). Efforts made by private landowners to charge a fee must face the fact that a "reasonable" substitute (public lands) can be obtained for a fee that is generally zero.³ This is one of the primary reasons why most writers believe that private landowners must offer recreational experiences that differ from those available on public lands. However, the existence of public lands has other implications that may prevent the establishment of a successful fee hunting area.

Property rights for animals

Most wildlife are, by law, owned and managed by state government. As a result they are provided publicly. Game animals that are hunted and killed are "rivals" in

³Fee and non fee costs are incurred by all users of public lands. The non fee costs of using federally administered lands may be higher than private lands because they tend to be more remote, but access fees for recreation activities on public lands are generally zero.

consumption because, if one hunter kills an animal, it is not available for another person (see the article by Randall for further discussion of the concepts of rival and exclusion that are used in this paper). The reason why it is difficult for a market to exist for wildlife stems from the fact that it is not feasible (technologically and, therefore, economically) to enforce property rights associated with a particular animal. As a result, the only rights that can be sold are for access to land. But, the sale of access to land in public land states is different than it is in states such as Texas where most of the land is privately owned because access to public lands is generally not limited.

Access limitations

If large quantities of public lands exist in an area, it makes it difficult to establish a fee hunting area for at least two interrelated reasons. First, animals can be driven (or will migrate) from private to public lands. To the degree this happens, the private landowner may not be able to capture monetary returns from access ⁴ because the animals are not on private lands. Secondly, if a large number of access points from public to private lands are available, the cost of limiting access to private lands may be prohibitive. It should be noted that enforcement costs can be changed by altering the institutional structure of property rights (laws governing use). For example, Utah recently passed a law that made it a misdemeanor to hunt on "posted" private lands without written permission from the owner. This has made

⁴Animals may also move from public to private lands or from one private landowner to another. In these cases, private landowners who have animals on their lands when hunting occurs may be able to capture monetary benefits and not bear many of the costs associated with the production of these animals.

the cost of enforcement less expensive but it does not eliminate all of the problems of limiting access.

The cost(s) of limiting access is one of the major reasons why it is difficult for public and private administrators to provide "high quality" hunting opportunities. Many studies have indicated that hunters prefer seeing a small number of hunters, large numbers of animals, and a high potential to see or take a "trophy" animal. The migratory nature of game animals and the potential of a particular area to sustain animals, coupled with the general inability to exclude⁵ hunters from using some area limits the ability of most land owners to offer "high quality" hunts or fee hunting areas.

Distribution of benefits/costs

Most hunted animals (e.g., deer, elk, water fowl, upland birds) have migratory habits. As a result, it is common for them to spend some portion of their life cycle on lands that differ from the lands where they are hunted/captured/killed. Therefore, landowners in one area commonly provide feed and/or cover for animals which are captured or killed elsewhere. As a result, one person(s) bears the cost, while some other person(s) receives the monetary gains (e.g., see the study by Nielsen, Lytle and Wagstaff). While this does not prevent the existence of fee hunting opportunities,⁶ it does cause external effects that cannot commonly be captured in the market.

⁵There are alternative ways of excluding some hunters. These include the issuance of permits to selected hunters and the requirement of certain characteristics (e.g., completion of a hunter safety course, use of guides).

⁶In areas where hunting occurs, this generally provides those individuals with an incentive to capture benefits without sharing in the cost(s) of producing the animals hunted/captured.

The impediments outlined above exist in most western states. But, fee hunting areas have been successfully implemented in some areas. The areas where fee hunting exists commonly have special characteristics.

Characteristics of Potential Fee Hunting Areas in Mixed Public-Private Lands

While the existence of animals is a necessary condition that must exist before a fee hunting area can be established, it is not sufficient. Some combination of the following will generally exist in areas having fee hunting.

Size

If an area is large, it may be able to negate the problems of limiting access and herd migration. One example is Deseret Ranch, which is located near Evanston, Wyoming. Deseret Ranch is a large, privately owned ranch (about 200,000 acres) that offers fee hunting for deer, elk, antelope, and buffalo. This ranch has successfully offered fee hunting for several years and is known for the trophy elk that can be taken from the ranch. In 1992, the ranch was selling trophy bull elk (5 points or more) for \$8,000, cow elk for \$150 (an access fee), trophy mule deer for \$3,200 and buffalo for \$1,500-3,000 each (these fees generally include guiding services). This is not a common type of ranch in Utah but it is indicative of many where fee hunting exists. For example. Jordon and Workman found that fee hunting ranch operations were significantly larger than were most ranches in Utah. However, not all ranchers wanting to offer fee hunting need to have large acreages. Several ranches can be combined to form a large enough unit to overcome the problems of enforcement and migration. The need for a relatively large acreage is recognized by some

administrators. For example, the Department of Wildlife Resources (DWR) in Utah specifies that at least 10,000 acres of land must be under control of a single entity (e.g., land owner or cooperative) before a permit can be obtained for a fee hunting unit.

Location

While size is one factor that is often necessary for the success of a fee hunting area, small areas can also successfully offer fee hunting opportunities. Smaller areas, with few exceptions, will have an advantage due to location. For example, they may be the only economically accessible point to a much larger area, they may be located on a major migration route, or they may provide an opportunity for a special type of hunting activity.

Type of Hunt

It has been argued (e.g., McDivitt) that fee hunting on private lands can occur only when landowners are able to offer experiences that differ from those available on public lands. Those who suggest that the experiences must differ emphasize the need to offer additional services (e.g., cabins, guiding services) from those available on other lands. The offering of additional services may not have a high enough demand that hunters are willing to pay for any difference(s) in the hunting experience. As a result, it may not be profitable to offer establish a fee hunting area. Therefore, the offering of services may be neither a necessary or sufficient reason for the success of a hunting area.

Fee Hunting Areas: A Conceptual Framework

Given the above discussion, one might ask when would it logically be feasible for a hunter to pay a fee for hunting on private lands instead of using public lands that can be hunted without a fee. The following represents a conceptual framework that might be used to make this evaluation. Economic theory suggests that hunters equate their marginal willingness-to-pay (WTP) to hunt to the marginal cost of hunting. This can be expressed symbolically as:

$$\text{WTP} = \text{Marginal hunter costs (HC)}$$

One would also expect hunting participation as long as the hunters marginal utility (MU) was greater than or equal to his marginal cost. The MU of hunting would however, vary with the type of hunt that was obtained. This might be viewed in the following manner.

$$\text{WTP}_{ijk} = \text{MU}_{ijk} * P_i * P_j * P_k \text{ where:}$$

WTP_{ijk} is marginal willingness-to-pay of hunt type i in area j for animal type k ;

MU_{ijk} is expected marginal utility to be received from participation in hunt type i in area j for animal type k ;

P_i is probability⁷ of obtaining a permit for hunt type i ;

P_j is probability of "taking" an animal in area j ; and

P_k is probability of "taking" animal type k .

Thus, as long as the probability of either success (obtaining a specific permit or "taking" a particular type of animal) or the marginal utility of hunting increases, WTP for hunting in a particular area will increase. All hunting types (e.g., fee,

⁷The framework suggested implicitly assumes that there is no correlation between the type of hunt, area or type of animal. This is probably not true in practice. This correlation would need to be incorporated into a more specific model.

control open, deer, elk) will generally not occur in any one area. As a result, the WTP for using a particular area will vary according to the opportunities that exist in the area being evaluated.⁸ The following example, which uses data for Utah, illustrates the use of this conceptual framework. It is assumed that the non fee cost of a trip to hunt deer is \$100 (HC) and is the same for all types of hunts considered. Hunter success ratios and the probability of acquiring various types of permits were obtained from the 1988 Division of Wildlife Resource (DWR) annual report. Given these data, the following is found if the same type of animal was taken in each area,

WTP (for open hunts in Utah) =

$MU \cdot .321 \cdot 1 = \100 (assumed HC)

where the probability of obtaining this permit is 1 and 32.1% of the hunters were "successful".

WTP (for controlled hunts in Utah) =

$MU \cdot .5 \cdot .765 = \110 (Assumed HC+ \$10)

where the cost of the permit was \$10, the probability of obtaining the permit was 50%, and 76.5% of the hunters were "successful".

WTP (for fee hunting areas in Utah) =

$MU \cdot 1 \cdot .9 = \$269$ (assumed HC plus \$169 for a guided hunt)

where the probability of obtaining this permit is also 1 (because a fee of \$169 is paid for an unguided deer hunt), and 90% of the hunters were assumed to be successful (data for hunter success for fee areas are not available).

Given the above data and assumptions, the marginal utility for each of the hunt types are fairly close to each other [open = $100/.321 = 212$, controlled = $110/(.5 \cdot .765) = 287$, and fee = $269/.90 = 298$). While these values are "crude" approximations, they do suggest that in 1988 Utah hunters allocated their

⁸In this paper, a successful hunt is generally synonymous with "killing" an animal. But, hunters participate for reasons other than killing an animal. The "taking" referred to in this section may, therefore, be simple observation, photography, or existence. Big-game animals have been emphasized in this paper, but the same conceptual framework can be used to evaluate other types of "hunting" activities (e.g., birds, fishing, observation).

effort by hunting type approximately⁹ equal to the marginal utility that they expected to receive. If this generalization was true for all types of hunts, areas, and types of animals (hypotheses to be tested), one could begin to estimate how much hunters would be willing to pay for benefits that differ by type of hunt, area, and/or type of animal killed. The demand for these attributes and/or services might then be estimated. This represents a set of topics that has received little, if any, attention in the literature. This conceptual framework might also be used to measure the substitutability of areas from a different perspective than has been used in the past.

While the above conceptual framework can also be used to evaluate the demand for other types of "hunts," such as photography and viewing, these are perhaps better evaluated as part of a futuristic view of hunting.

The Future of Fee Hunting Opportunities

While recreational use of federal lands has been increasing over time (Figures 1 and 2), hunting has not kept pace with other types of recreational activity (Cordell et al.; Flather and Hoekstra; Clawson and Van Doren; Presidents Commission on Americans Outdoors). If these trends are the result of declines in the marginal utility that is being obtained by hunters, the potential for fee hunting would decline because the WTP would decline, *ceteris paribus*. However, this is not the only trend that will have an impact on the potential for the establishment of fee hunting areas in public land states. There is some evidence that the demand for nonconsumptive use (e.g.,

⁹The higher values for the controlled hunts and fee hunt areas may reflect the "taking" of a different type of animal.

photography, viewing) of wildlife is increasing relative to traditional hunting activity. These trends have some interesting implications that need to be considered when evaluating the potential for having fee hunting areas.

Hunting For "Kill"

The age structure of America's population is increasing. Because most hunters are relatively young, the demand for hunting is expected to decline. In addition, an increasing portion of the nation's citizens have ethnic and urban backgrounds that do not have a history of being involved in hunting. Furthermore, there is an increasingly vocal group of "animal rights" activists who want to abolish all activities that harm animals. These trends suggest that the demand for traditional hunting activities and, thereby, the demand for fee hunting areas will decline in the future. While the potential to have hunting abolished on private lands is not high, it is possible that traditional hunting activity could be banned from public lands where "animal rights" or other types of interest groups can have an impact on agency policies. This could bolster the demand for fee hunting on private lands because fewer substitutes would exist but, the expected decline in the demand for hunting will have a dampening impact on potential for fee hunting.

Fish and Game Management Activities

Some individuals have suggested that Robertson-Pittman funds (tax on firearms and other sporting goods) be diverted to nongame activities. If this occurs, it could reduce hunter success ratios (kills) if fish and game managers placed less emphasis on managing hunted species. It is not clear what impact agency

management activities might have on hunting success. But, if hunter success declines their willingness to pay would be expected to decline. The number of game animals may decline if managers place greater emphasis on species that are not hunted but, this decline may make it more profitable for private landowners to undertake activities that favor wildlife that are hunted.

A switch of emphasis from game to nongame species by fish and game departments may have a mixed impact in fee hunting areas. For example, transplanting activities have helped many who would like to offer hunting activities for a fee. Some species (e.g., mule deer in the western U.S., and white-tail in the mid-West) are widely dispersed, while other species (e.g., elk, bighorn sheep, antelope) are less generally distributed. It has commonly been the policy of fish and game departments in most states to increase the dispersion of species that have had limited spatial distribution. This has provided hunting opportunities in new areas as these animals are transplanted from existing areas. If game management agencies reduce efforts to transplant animals, it will reduce the opportunities for hunting in new areas. This would benefit some land owners while it would hurt others¹⁰.

Nonconsumptive Uses

At the present time, nonconsumptive users rarely pay directly for wildlife-related activities. But, some potential may exist for the establishment of fee areas.

¹⁰This is the reason why transplanting activities tend to be controversial. This is especially true when animals are transplanted to public lands and game use replaces traditional uses such as livestock grazing or when the newly transplanted animals use private lands and no compensation is obtainable by the land owner affected.

If private landowners in mixed private and public land areas could offer activities that were not available on public lands, he/she may be able to capture the benefits of these differences. This potential may also exist if the probability of observation was different than it was on public lands. However, private landowners would face the same problems that fee hunting areas now face--the availability of inexpensive, or free public lands.

"Free" access to public lands would not be the only problem facing private landowners who would hope to sell access rights for nonconsumptive uses. If nonconsumptive uses were to be emphasized, the probability of observations would change because animals would not be removed from populations. As a result, animal populations become nonrival in consumption. This makes them less likely to be captured by the market.

Summary and Conclusions

The ability of private landowners to implement a fee hunting system is limited in states having large acreages of public lands. Those landowners who are likely to be successful will be a result of their ranch size, location, and/or services offered. In general, landowners may be able to implement a fee hunting system if they can increase the satisfaction a hunter receives from a hunt. This can be done primarily by increasing the probability that hunters have a "successful" outing.

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